Appendix A

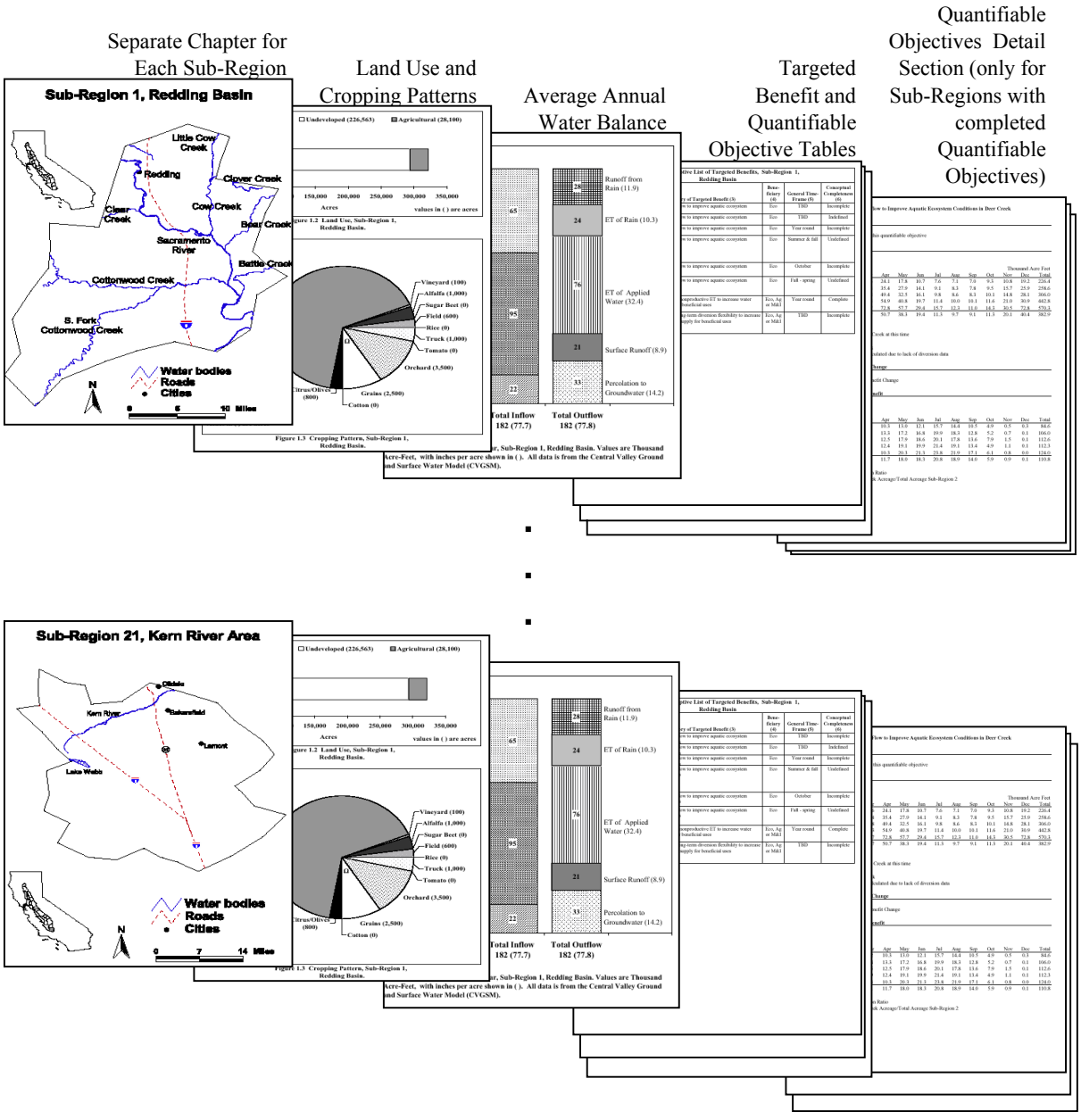
Complete List of Quantifiable Objectives by Sub-Region

Appendix A contains a list of the completed and potential Quantifiable Objectives (QOs). To-date, 196 potential QOs have been identified. Of these, approximately 50 have been completed. WUE proposals that incorporate completed QOs will be given extra weight in the selection process.

Readily available data does not exist to allow completion of the remaining QOs. However, approximately 45 of the uncompleted QOs have been identified as high priority, and proposals that are linked to these priority outcomes (or Targeted Benefits) will also receive extra weight in the selections (although not as much weight as those that incorporate completed QOs).

Appendix A is organized into 21 chapters that correspond to the 21 Sub-Regions defined in the QO analysis. Each chapter contains background information and details as illustrated in Figure A.I.

Figure A.I. Organization of Appendix A



Sub-Region 14, Westlands Area

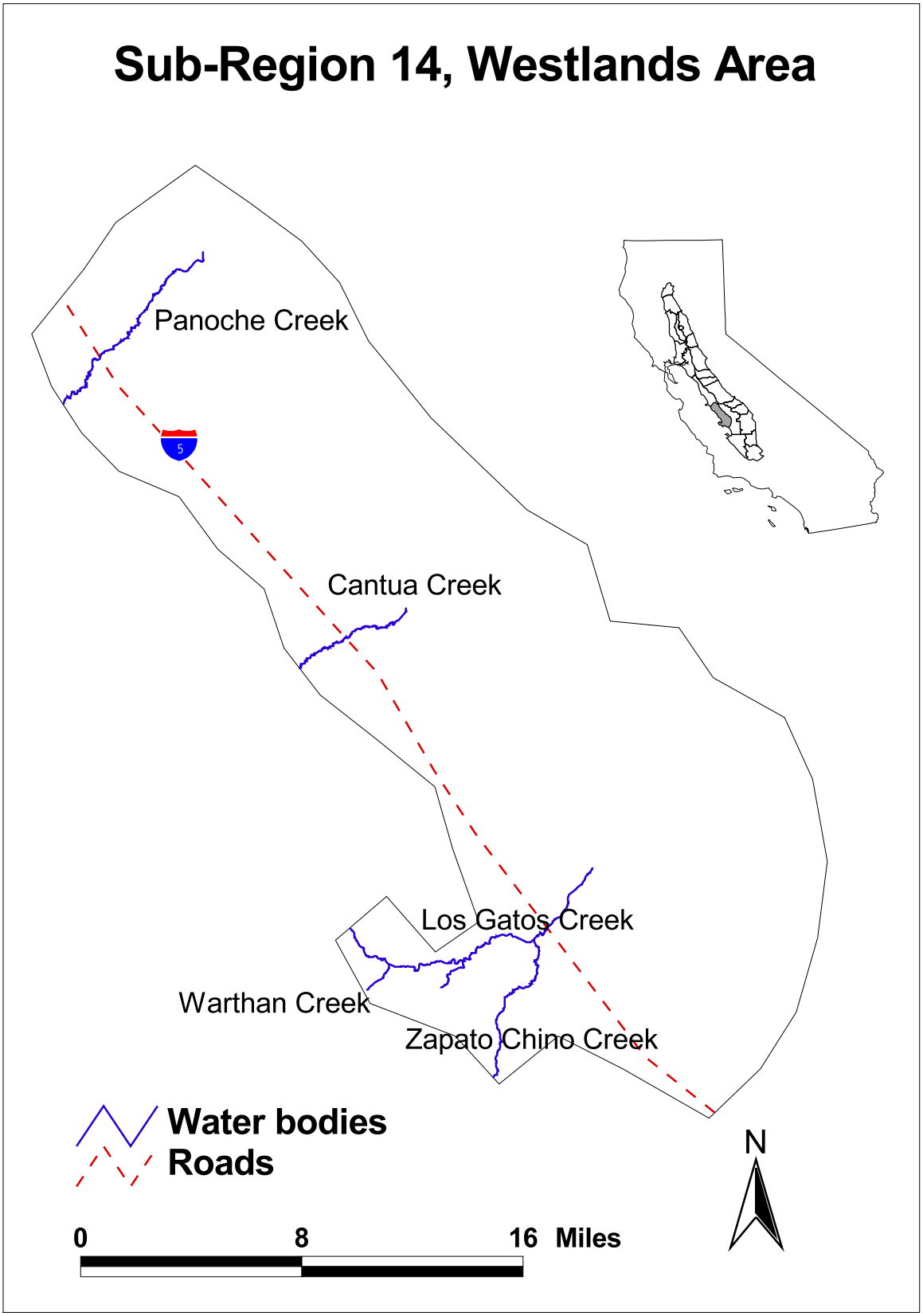


Figure A.14.2 Land Use, Sub-Region 14, Westlands Area.

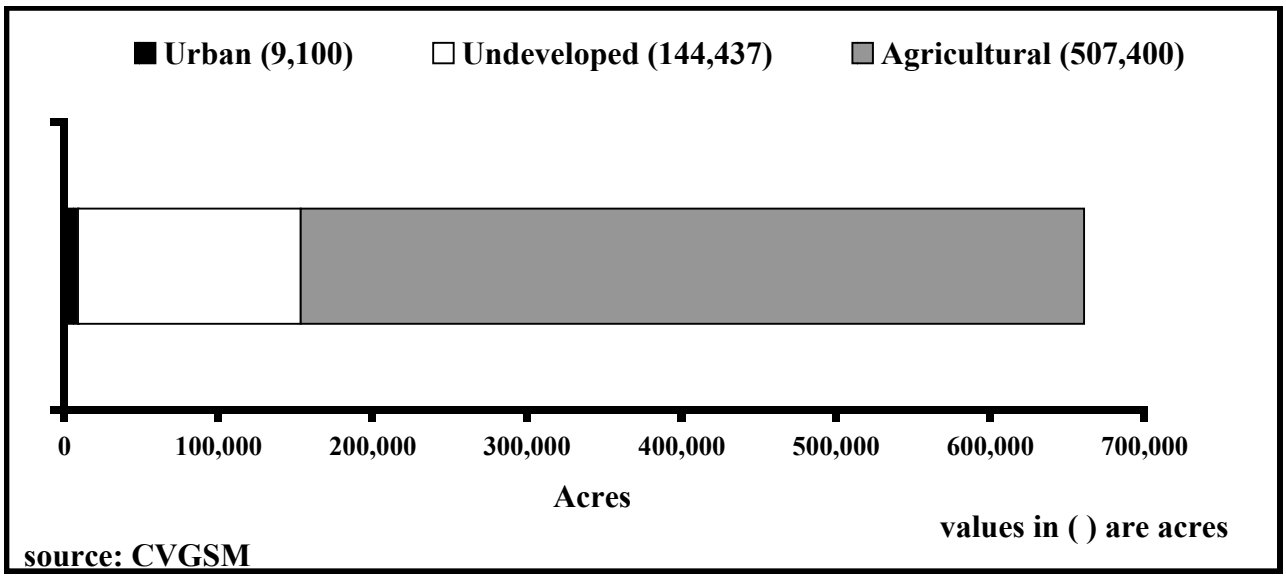
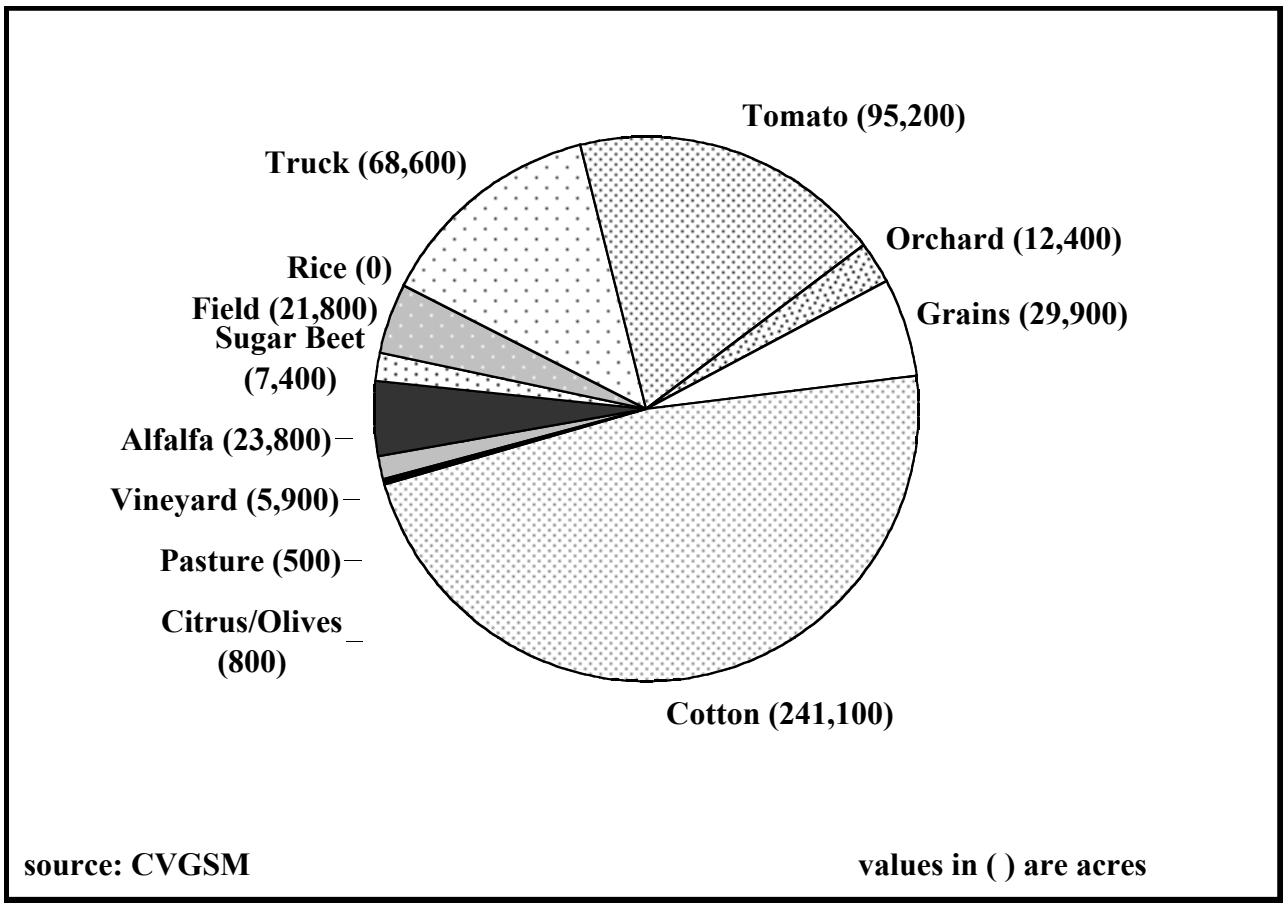
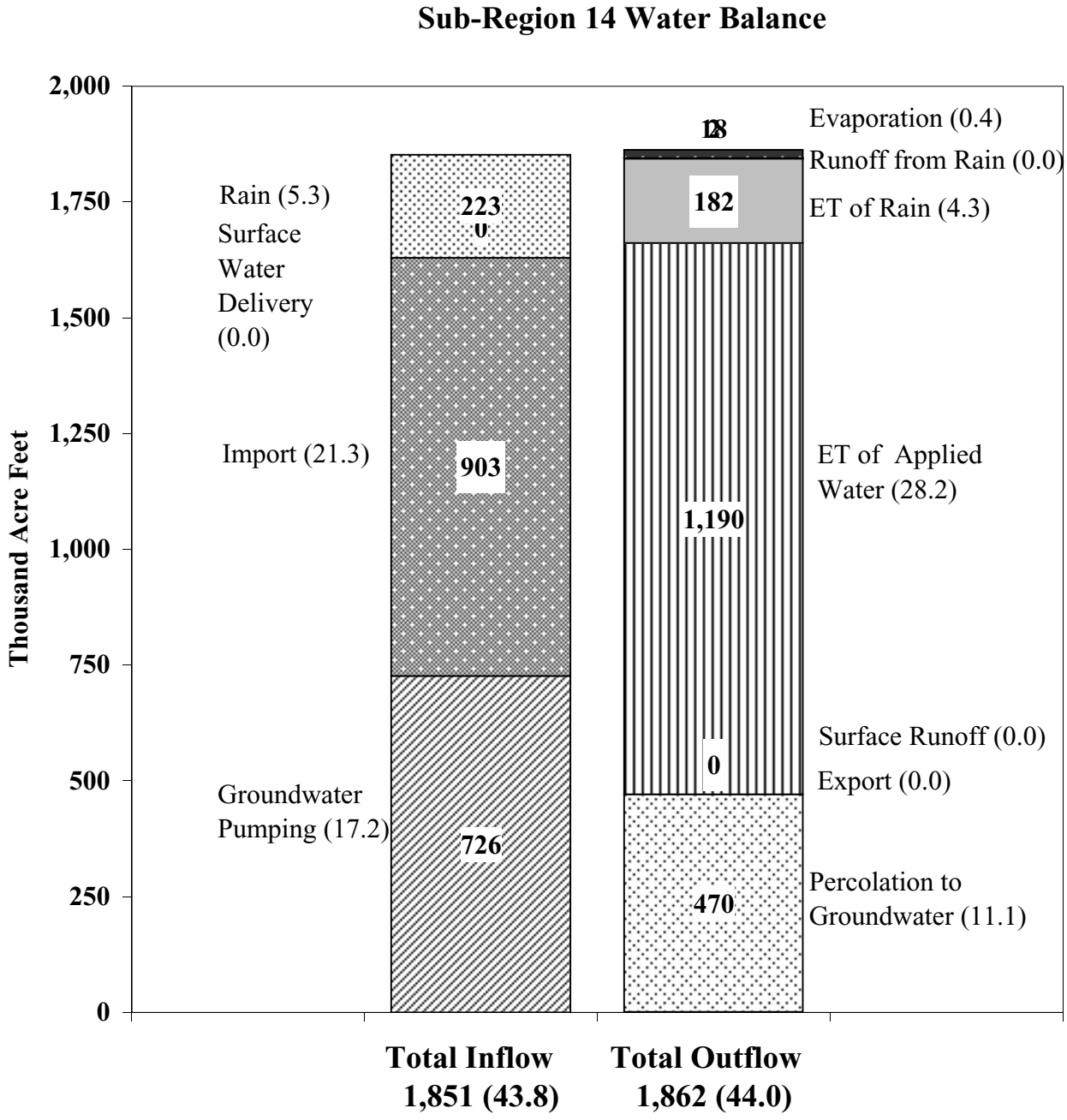


Figure A.14.3 Cropping Pattern, Sub-Region 14, Westlands Area.





Farm Water Balance, Average Year, Sub-Region 14, Westlands Area. Values are Thousand Acre-Feet, with inches per acre shown in ( ). All data is from the Central Valley Ground and Surface Water Model (CVGSM).

Table A.14.1. Descriptive List of Targeted Benefits, Sub-Region 14, Westland Area					
TB # (1) [duplicate]	**Location (2)**	**Category of Targeted Benefit (3)**	**Bene-ficiary (4)**	**General Time-Frame (5)**	**Conceptual Completeness (6)**
94	Panoche Creek	Quality: Reduce native constituents to enhance and maintain beneficial uses of water	Eco or M&I	TBD	Complete
105	Panoche Creek	Quality: Reduce sediments to enhance and maintain beneficial uses of water	Eco, Ag or M&I	TBD	Complete
163	All affected lands	Quantity: Decrease flows to salt sinks to increase the water supply for beneficial uses	Eco, Ag or M&I	Irrigation season	Complete
164	All affected lands	Quantity: Decrease nonproductive ET to increase water supply for beneficial uses	Eco, Ag or M&I	Year round	Complete
165	All suitable lands	Quantity: Provide long-term diversion flexibility to increase the water supply for beneficial uses	Eco, Ag or M&I	TBD	Incomplete
166	Salt affected soils	Quantity: Provide long-term diversion flexibility to increase the water supply for beneficial uses	Ag	Irrigation season	Complete

Table A.14.2. Quantified Targeted Benefits, Sub-Region 14, Westland Area	
TB # (1) [duplicate]	**Source and Description of Quantified Targeted Benefit (7)**
94	303(d): Reduce selenium concentration to 5 ug/L.
105	303(d): Reduce sedimentation/siltation to _____.
163	Core: Reduce existing flows to salt sinks by _____ acre-feet per year.
164	Core: Reduce unwanted ET by _____ acre-feet per year.
165	Core: Enhance the effectiveness of potential conjunctive use programs by reducing flows to groundwater to _____ acre feet per year during periods of shortage; and increasing flows to groundwater to _____ acre feet per year during periods of excess.
166	Core: While remaining within the salinity threshold for a given crop, take advantage of periodic opportunities to reduce salinity impacts by increasing leaching by _____ during periods of excess supply and by reducing by ____ leaching during water short periods.

Table A.14.3. Quantified Targeted Benefit Change, Sub-Region 14, Westland Area								
	Reference Condition		Quantified Targeted Benefit		Quantified Targeted Benefit Change			Specific Time-Frame (11)
TB # (1) [duplicate]	Data Source (8)	Availability (9)	Data Source (8)	Data Availability (9)	Data Source (8)	Availability (9)	Range of Values (10)	
94	RWQCB	Proven - precise	RWQCB	Proven - precise	Calculated	Proven - precise	TBD	TBD
105	TBD	TBD	TBD	Proven - precise	Calculated	TBD	TBD	TBD
163	CVGSM/Core	Rough estimate	Core	Rough estimate	Calculated	Rough estimate	TBD	Irrigation season
164	CVGSM	Unproven-precise	Core	Rough estimate	Calculated	Rough estimate	8.9 TAF/yr	TBD
165	CVGSM	Unproven-precise	Core	Rough estimate	Calculated	Rough estimate	TBD	TBD
166	Core	Rough estimate	Core	Rough estimate	Calculated	Rough estimate	TBD	Irrigation season

Table A.14.4. Quantifiable Objective, Sub-Region 14, Westland Area		
TB # (1) [duplicate]	**Achievable Agricultural Potential (12)**	**Quantifiable Objective (13)**
94	TBD	TBD
105	TBD	TBD
163	TBD	TBD
164	8.9 TAF per year plus additional water generated through reduction in application through improved irrigation systems	8.9 TAF per year plus additional water generated through reduction in application through improved irrigation systems
165	TBD	TBD
166	TBD	TBD

Table A.14.5. Affected Flow Paths and Possible Actions, Sub-Region 14, Westland Area		
TB # (1) [duplicate]	**Affected Flow Paths (14)**	**Possible Actions (provided as examples; proposers are encouraged to consider local actions that are not listed) (15)**
94	TBD	TBD
105	TBD	TBD
163	TBD	TBD
164	ETAW	Reduce ET flows using improved irrigation methods, such as drip irrigation, and planting densities.
165	TBD	TBD
166	TBD	TBD

Detail 164, Decrease Nonproductive ET, SubRegion 14

Step 1. Quantified Targets

A. Acreage Assumed for Reduction of Nonproductive ET

source: CVGSM Sub-Region 14

Crop	Potential for ET Red.	Existing	Assumed for ET Reduction*	
		acres		percent
Pasture	No	500	0	0%
Alfalfa	No	23,800	0	0%
Sugar Beet	No	7,400	0	0%
Field	No	21,800	0	0%
Rice	No	0	0	0%
Truck	Yes	68,600	20,580	30%
Tomato	Yes	95,200	28,560	30%
Orchard	Yes	12,400	3,720	30%
Grains	No	29,900	0	0%
Vineyard	Yes	5,900	1,770	30%
Cotton	No	241,100	0	0%
Citrus and Olives	Yes	800	240	30%
Total		507,400	54,870	11%

*The Assumed Acreage for ET Reduction is 30% of the crops that have the Potential for ET Reduction.

B. Existing ET for Sub-Region 14

source: CVGSM

Inches

Crop	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Pasture	---	---	---	---	---	---	---	---	---	---	---	---	---
Alfalfa	---	---	---	---	---	---	---	---	---	---	---	---	---
Sugar Beet	---	---	---	---	---	---	---	---	---	---	---	---	---
Field	---	---	---	---	---	---	---	---	---	---	---	---	---
Rice	---	---	---	---	---	---	---	---	---	---	---	---	---
Truck	0.00	0.00	0.00	2.60	2.90	3.30	3.40	1.80	1.30	1.20	0.00	0.00	16.50
Tomato	0.00	0.00	0.00	3.60	6.70	7.60	5.40	1.60	1.00	0.00	0.00	0.00	25.90
Orchard	0.90	1.30	1.70	2.90	4.90	6.00	6.70	5.70	3.50	2.10	1.00	0.70	37.40
Grains	---	---	---	---	---	---	---	---	---	---	---	---	---
Vineyard	0.00	0.00	0.00	1.00	3.70	5.80	6.60	5.50	3.50	1.30	0.00	0.00	27.40
Cotton	---	---	---	---	---	---	---	---	---	---	---	---	---
Citrus and Olives	0.00	0.00	1.90	2.70	4.20	4.80	5.00	4.20	2.80	2.00	0.00	0.00	27.60
Total	0.06	0.09	0.12	3.09	5.04	5.81	4.77	2.09	1.37	0.64	0.07	0.05	23.21

C. ET from Rain for Sub-Region 14

source: CVGSM

Inches

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.00	0.41	0.39	0.49	0.24	0.00	0.44	0.00	2.87	0.91	0.00	0.00	5.76
2) Dry	0.00	0.54	0.65	0.52	0.22	0.00	0.45	0.00	2.62	0.87	0.00	0.00	5.87
3) B Norm	0.00	0.48	0.43	0.75	0.15	0.00	0.42	0.00	2.55	0.92	0.00	0.00	5.69
4) A Norm	0.00	0.65	0.81	0.71	0.09	0.00	0.41	0.00	2.50	0.77	0.00	0.00	5.93
5) Wet	0.28	0.66	1.01	0.92	0.32	0.00	0.36	0.00	2.50	0.85	0.00	0.00	6.90
Wtd Avg.	0.04	0.54	0.64	0.66	0.20	0.00	0.42	0.00	2.63	0.86	0.00	0.00	5.99

D. Existing ETAW for Sub-Region 14

source: calculated = Step 1B.(Average Total) - Step 1C., (set to 0 if Step 1B. - Step 1C. <0) Inches

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.06	0.00	0.00	2.60	4.81	5.81	4.33	2.09	0.00	0.00	0.07	0.05	19.81
2) Dry	0.06	0.00	0.00	2.57	4.82	5.81	4.32	2.09	0.00	0.00	0.07	0.05	19.79
3) B Norm	0.06	0.00	0.00	2.34	4.90	5.81	4.36	2.09	0.00	0.00	0.07	0.05	19.67
4) A Norm	0.06	0.00	0.00	2.38	4.96	5.81	4.36	2.09	0.00	0.00	0.07	0.05	19.78
5) Wet	0.00	0.00	0.00	2.17	4.73	5.81	4.41	2.09	0.00	0.00	0.07	0.05	19.32
Wtd Avg.	0.05	0.00	0.00	2.43	4.84	5.81	4.35	2.09	0.00	0.00	0.07	0.05	19.70

E. Target ETAW for Sub-Region 14

source: calculated = Step 1D. * 90% Inches

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.05	0.00	0.00	2.34	4.33	5.23	3.90	1.88	0.00	0.00	0.06	0.04	17.83
2) Dry	0.05	0.00	0.00	2.31	4.34	5.23	3.89	1.88	0.00	0.00	0.06	0.04	17.81
3) B Norm	0.05	0.00	0.00	2.10	4.41	5.23	3.92	1.88	0.00	0.00	0.06	0.04	17.70
4) A Norm	0.05	0.00	0.00	2.14	4.46	5.23	3.93	1.88	0.00	0.00	0.06	0.04	17.80
5) Wet	0.00	0.00	0.00	1.95	4.25	5.23	3.97	1.88	0.00	0.00	0.06	0.04	17.39
Wtd Avg.	0.05	0.00	0.00	2.19	4.36	5.23	3.92	1.88	0.00	0.00	0.06	0.04	17.73

Step 2. Reference Condition

For ET Reduction the Reference Condition is the existing Crop ET, Step 1B.

Step 3. Quantified Targeted Benefit Change

A. Quantified Targeted Benefit Change for Sub-Region 14

source: calculated = Step 1D - Step 1E Inches

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	---	0.26	0.48	0.58	0.43	0.21	---	---	---	---	1.96
2) Dry	---	---	---	0.26	0.48	0.58	0.43	0.21	---	---	---	---	1.96
3) B Norm	---	---	---	0.23	0.49	0.58	0.44	0.21	---	---	---	---	1.95
4) A Norm	---	---	---	0.24	0.50	0.58	0.44	0.21	---	---	---	---	1.96
5) Wet	---	---	---	0.22	0.47	0.58	0.44	0.21	---	---	---	---	1.92
Wtd Avg.	---	---	---	0.24	0.48	0.58	0.44	0.21	---	---	---	---	1.95

B. Quantified Targeted Benefit Change for Sub-Region 14

source: calculated = Step 1D - Step 1E Thousand Acre Feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	---	1.19	2.20	2.66	1.98	0.96	---	---	---	---	9.0
2) Dry	---	---	---	1.17	2.21	2.66	1.98	0.96	---	---	---	---	9.0
3) B Norm	---	---	---	1.07	2.24	2.66	1.99	0.96	---	---	---	---	8.9
4) A Norm	---	---	---	1.09	2.27	2.66	1.99	0.96	---	---	---	---	9.0
5) Wet	---	---	---	0.99	2.16	2.66	2.02	0.96	---	---	---	---	8.8
Wtd Avg.	---	---	---	1.11	2.22	2.66	1.99	0.96	---	---	---	---	8.9

Step 4. Area Affected by Targeted Benefit

Area affected are the 54,870 acres identified in Step 1A.

Step 5. Water Flow Path Elements

The flow path elements used in this analysis are given in Step 1.

Step 6. Idealized Agricultural Potential

Additional ET research is required to determine this component.

Step 7. Achievable Agricultural Potential

The farm Available Agricultural Potential is the same as Step 3B.

Step 8. Quantifiable Objective

A. For ET Reduction the Quantifiable Objective is Step 3B